



Perfluorooctanoic Acid (PFOA) and its derivatives

Perfluorooctanoic acid (PFOA), also known as perfluorooctanoate and 1-octanoic acid 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro, is a fully fluorinated eight-carbon chain carboxylic acid (CAS Registry Number 335-67-1). Common derivatives of PFOA include the ammonium ("APFO"), sodium, potassium and silver salts of the acid.

PFOA, a man-made substance that does not occur naturally in the environment, has unique physical and surfactant properties. Concerns have been raised that certain fluorinated telomers may break down or degrade to form PFOA in the environment. Fluorinated telomers are small fluorine-containing polymers.

PFOA is an industrial chemical processing aid typically used to make certain fluoropolymers which have a variety of consumer and industrial applications. PFOA may also have specialised surfactant uses. Applications of PFOA are characteristically high-performance coatings on fabrics, metal surfaces and fabricated parts and may include coatings on articles such as non-stick cookware, specialized garments and textiles and electronics components.

PFOA-based chemicals and chemicals which may degrade to PFOA are of interest because PFOA may be hazardous to human health and the environment. The United States Environmental Protection Agency (US EPA) released a draft risk assessment of PFOA in April 2003. PFOA is persistent in the environment and has been found in humans. Concerns are raised about other effects of PFOA in laboratory animals. The report, however, is unable to determine whether PFOA poses an unreasonable risk to the public because considerable scientific uncertainties remain about PFOA.

Potential exposure routes for PFOA include PFOA production and use, PFOA contamination in other products, and degradation of certain fluoropolymers to PFOA.

NICNAS notes it is likely that some importers and users may not know if products contain PFOA and its derivatives (including, fluoropolymers which may degrade to PFOA) because such chemical ingredients may not be mentioned on Material Safety Data Sheets and labels.

Australian Data

Information collected by NICNAS to date shows the following:

Manufacture

No manufacture of PFOA, PFOA derivatives or fluoropolymers that may degrade to PFOA has been reported in Australia.

Importation and Use

Primer for non-stick metal cookware

The import of a liquid fluoropolymer surfactant dispersion product is reported. The importation equates to approximately 50 gm and 25 gm of PFOA in 2003 and 2004, respectively.

The factory-applied, oven-baked dispersion coating is used for coating metal cookware and is intended to impart a continuous solid non-stick coating to the metal surface. Volatilisation and destruction of PFOA is reported during the manufacturing process which fuses the fluoropolymer to the metal surface and involves a thermal step at 350-400°C.

Fluoropolymer dispersion polymer in paints

The import of a fluoropolymer dispersion polymer for use in paints is reported. The importation equates to 10 kg annually of PFOA.

Fire-fighting foam

The import in the past of two fluorosurfactant products for use in the manufacture of Class B fire fighting foam is reported. The importation equated to approximately 48 gm and 0.6 gm of PFOA in 2002 and 2003, respectively. The importation and sale of the products in Australia was discontinued in 2003.

Textile and carpet protection

Textile and carpet protection products containing some fluoropolymers are imported into Australia. Information has been received from importers and suppliers that research is presently being undertaken internationally via the Telomer Research Program (in conjunction with the United States Environmental Protection Agency) to determine whether these products may degrade to PFOA.

Other uses of telomers

Additional polymers that include monomers based on perfluorinated telomers are reported. These chemicals have been assessed by the NICNAS New Chemicals program and are currently in use under certificate. These chemicals have applications in fabric protection, surface coating and printing. Under section 64(2)(e) of the *Industrial Chemicals Notification and Assessment Act 1989*, there is a requirement that introducers of these chemicals must notify the Director, NICNAS of any additional information that has become available (within 28 days of the occurrence) as to the adverse health effects or adverse environmental effects of these chemicals.

National and International Activities

There is ongoing national and international activity in relation to PFOA. The Organisation for Economic Cooperation and Development (OECD) is collating data on the uses of PFOA manufactured and used globally. NICNAS, as the Australian industrial chemical regulator, has assisted and provided information to the OECD with regard to this activity.

The United States Environmental Protection Agency provides regular updates on their activities for PFOA and fluorinated telomers to NICNAS. The US EPA released a revised draft hazard assessment of PFOA and its salts and preliminary risk assessment on PFOA and its salts in 2002 and 2003, respectively. On-going scientific investigations of PFOA and the potential sources and pathways of PFOA in the environment will be used to update these assessments. The investigations include studies to determine

the potential for generation of PFOA and characterization of release of PFOA from articles – such as garments, household cookware, textiles and carpets.

NICNAS Advice

Because of concerns over PFOA and fluorinated telomers that may degrade to PFOA, NICNAS advises that:

- importers and users of these chemicals remain vigilant to the ongoing international activities regarding PFOA and related chemicals. Updates about these activities can be accessed from the NICNAS web site at www.nicnas.gov.au
- information on the safe use and handling of these chemicals be provided to all users in the relevant and most recent Material Safety Data Sheets (MSDSs) available from the suppliers of these chemicals
- on completion of the present scientific investigation of PFOA and potential sources and pathways of PFOA in the environment, NICNAS will, if needed, make recommendations on appropriate regulatory activities

How to contact NICNAS

If you want to find out more about these issues or have information on PFOA and perfluorinated telomers in Australia, you can contact NICNAS at:

Ph: 1800 638 528 **Fax:** 02 8577 8888

Write to: GPO Box 58 Sydney NSW 2001 Australia

Information on assessment of chemicals by NICNAS is available at:

<http://www.nicnas.gov.au/about/ourapproach.htm>

Copies of the US EPA reports and access to the US EPA Docket on PFOA can be accessed from the web site at: www.nicnas.gov.au/publications/pdf/pfospreliminaryriskassessment.pdf